IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of   :   TANNO et al.

Application No.   :

Filed   :   herewith

Title   :   CELL SEARCH METHOD AND APPARATUS FOR MOBILE
                                 STATION IN MOBILE COMMUNICATION SYSTEM

BOX PATENT APPLICATION
Assistant Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Please enter the following amendment prior to examining the above-identified application, the specification of which is filed herewith.

In the Specification:

Please delete claims 1-104 as included in the specification and enter the following replacement sheets numbered as pages 27-58, and having claims 1-104. The replacement sheets have the same claims as filed but they are renumbered so that the dependent claims are grouped together with the corresponding independent claim in accordance with MPEP 608.01(m)

Entry of this amendment is respectfully requested.

Respectfully submitted,

Dated: _8-31-01_

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WHAT IS CLAIMED IS:

1. A cell search method for a mobile station in a mobile communication system, the method being characterized by
5 comprising a first step of despreading a received signal using a common spreading code common to all slots and detecting slot boundaries on the basis of a first average correlation coefficient, a second step of despreading the signal on the basis of said slot boundaries detected at
10 the first step, using different individual spreading codes for said respective slots, and detecting frame boundaries and a scramble code group on the basis of a second average correlation coefficient, and a third step of descrambling a common pilot signal on the basis of said frame boundaries
15 and scramble code group detected at the second step, and detecting a scramble code on the basis of a third average correlation coefficient, and wherein after said first, second, and third steps have been repeated, said first step is executed to detect slot boundaries using a plurality
20 of said first average correlation coefficients.

2. The cell search method for a mobile station in a mobile communication system according to Claim 1, characterized in that said second step comprises detecting frame
25 boundaries and a scramble code group using a plurality of said second average correlation coefficients with which said slot boundaries detected at said first step are equal.

3. The cell search method for a mobile station in a mobile communication system according to Claim 1, characterized in that said third step comprises detecting a scramble code using a plurality of said third average correlation coefficients with which said frame boundaries and scramble code group detected at said second step are equal.

4. The cell search method for a mobile station in a mobile communication system according to Claim 1, characterized in that said first step comprises calculating a fourth average correlation coefficient by averaging a plurality of said first average correlation coefficients within a predetermined averaging section, and detecting said slot boundaries using a timing with which the fourth average correlation coefficient is largest.

5. The cell search method for a mobile station in a mobile communication system according to Claim 2, characterized in that said third step comprises detecting a scramble code using a plurality of said third average correlation coefficients with which said frame boundaries and scramble code group detected at said second step are equal.

6. The cell search method for a mobile station in a mobile communication system according to Claim 2, characterized in that said first step comprises calculating a fourth

average correlation coefficient by averaging a plurality of said first average correlation coefficients within a predetermined averaging section, and detecting said slot boundaries using a timing with which the fourth average
5   correlation coefficient is largest.

7.   The cell search method for a mobile station in a mobile communication system according to Claim 2, characterized in that said second step comprises calculating a fifth
10   average correlation coefficient by averaging, within a predetermined averaging section, a plurality of said second average correlation coefficients with which said slot boundaries detected at said first step are equal, and detecting said frame boundaries and scramble code group
15   using a timing with which the fifth average correlation coefficient is largest.

8.   The cell search method for a mobile station in a mobile communication system according to Claim 3, characterized
20   in that said first step comprises calculating a fourth average correlation coefficient by averaging a plurality of said first average correlation coefficients within a predetermined averaging section, and detecting said slot boundaries using a timing with which the fourth average
25   correlation coefficient is largest.

9.   The cell search method for a mobile station in a mobile

communication system according to Claim 3, characterized
in that said third step comprises calculating a seventh
average correlation coefficient by averaging, within a
predetermined averaging section, a plurality of said third
5   average correlation coefficients with which said frame
boundaries and scramble code group detected at said second
step are equal, and detecting said scramble codes using
the seventh average correlation coefficient.

10   10.   The cell search method for a mobile station in a mobile
communication system according to Claim 5, characterized
in that said first step comprises calculating a fourth
average correlation coefficient by averaging a plurality
of said first average correlation coefficients within a
15   predetermined averaging section, and detecting said slot
boundaries using a timing with which the fourth average
correlation coefficient is largest.

11.   The cell search method for a mobile station in a mobile
20   communication system according to Claim 5, characterized
in that said second step comprises calculating a fifth
average correlation coefficient by averaging, within a
predetermined averaging section, a plurality of said
second average correlation coefficients with which said
25   slot boundaries detected at said first step are equal, and
detecting said frame boundaries and scramble code group
using a timing with which the fifth average correlation

coefficient is largest.

12. The cell search method for a mobile station in a mobile communication system according to Claim 5, characterized
5   in that said third step comprises calculating a seventh average correlation coefficient by averaging, within a predetermined averaging section, a plurality of said third average correlation coefficients with which said frame boundaries and scramble code group detected at said second
10 step are equal, and detecting said scramble codes using the seventh average correlation coefficient.

13. The cell search method for a mobile station in a mobile communication system according to Claim 4, characterized
15 in that a plurality of said first average correlation values are weighted.

14. The cell search method for a mobile station in a mobile communication system according to Claim 4, characterized
20 in that said fourth average correlation value is calculated by adding a value obtained by multiplying a plurality of said first average correlation values by a forgetting factor.

25 15. The cell search method for a mobile station in a mobile communication system according to Claim 4, characterized in that said predetermined averaging section is adaptively

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changed according to a state of said mobile station.

16. The cell search method for a mobile station in a mobile communication system according to Claim 13, characterized in that a value of said weighting is adaptively changed according to the state of said mobile station.

17. The cell search method for a mobile station in a mobile communication system according to Claim 14, characterized in that a value of said forgetting factor is adaptively changed according to the state of said mobile station.

18. The cell search method for a mobile station in a mobile communication system according to Claim 15, characterized in that the state of said mobile station is either a state immediately after power-on or a standby state or a communicating state.

19. The cell search method for a mobile station in a mobile communication system according to Claim 15, characterized in that the state of said mobile station is set according to a movement speed of said mobile station in advance.

20. The cell search method for a mobile station in a mobile communication system according to Claim 16, characterized in that the state of said mobile station is either a state immediately after power-on or a standby state or a

communicating state.

21. The cell search method for a mobile station in a mobile communication system according to Claim 16, characterized in that the state of said mobile station is set according to a movement speed of said mobile station in advance.

22. The cell search method for a mobile station in a mobile communication system according to Claim 17, characterized in that the state of said mobile station is either a state immediately after power-on or a standby state or a communicating state.

23. The cell search method for a mobile station in a mobile communication system according to Claim 17, characterized in that the state of said mobile station is set according to a movement speed of said mobile station in advance.

24. A cell search method for a mobile station in a mobile communication system, the method being characterized by comprising a first step of despreading a received signal using a common spreading code common to all slots and detecting slot boundaries on the basis of a first average correlation coefficient, a second step of despreading the signal on the basis of said slot boundaries detected at the first step, using different individual spreading codes for said respective slots, and detecting frame boundaries

and a scramble code group on the basis of a second average
correlation coefficient, and a third step of descrambling
a common pilot signal on the basis of said frame boundaries
and scramble code group detected at the second step, and
5 detecting a scramble code on the basis of a third average
correlation coefficient, and wherein after said first,
second, and third steps have been repeated, frame
boundaries and a scramble code group are detected using
a plurality of said second average correlation
10 coefficients with which said slot boundaries detected at
said first step are equal.

25. The cell search method for a mobile station in a mobile
communication system according to Claim 24, characterized
15 in that said third step comprises detecting a scramble code
using a plurality of said third average correlation
coefficients with which said frame boundaries and scramble
code group detected at said second step are equal.

20 26. The cell search method for a mobile station in a mobile
communication system according to Claim 24, characterized
in that said second step comprises calculating a fifth
average correlation coefficient by averaging, within a
predetermined averaging section, a plurality of said
25 second average correlation coefficients with which said
slot boundaries detected at said first step are equal, and
detecting said frame boundaries and scramble code group

using a timing with which the fifth average correlation coefficient is largest.

27. The cell search method for a mobile station in a mobile communication system according to Claim 25, characterized in that said second step comprises calculating a fifth average correlation coefficient by averaging, within a predetermined averaging section, a plurality of said second average correlation coefficients with which said slot boundaries detected at said first step are equal, and detecting said frame boundaries and scramble code group using a timing with which the fifth average correlation coefficient is largest.

28. The cell search method for a mobile station in a mobile communication system according to Claim 25, characterized in that said third step comprises calculating a seventh average correlation coefficient by averaging, within a predetermined averaging section, a plurality of said third average correlation coefficients with which said frame boundaries and scramble code group detected at said second step are equal, and detecting said scramble codes using the seventh average correlation coefficient.

29. The cell search method for a mobile station in a mobile communication system according to Claim 26, characterized in that a plurality of said second average correlation

values are weighted.

30.   The cell search method for a mobile station in a mobile communication system according to Claim 26, characterized in that if said slot boundaries detected at said first step are equal, a value is added which is obtained by multiplying a sixth average correlation coefficient obtained by averaging a plurality of said second average correlation coefficients within a predetermined averaging section, by a forgetting factor, and if said slot boundaries detected at said first step are different, a result of the addition of said second average correlation coefficients is defined as said fifth average correlation coefficient.

31.   The cell search method for a mobile station in a mobile communication system according to Claim 26, characterized in that said predetermined averaging section is adaptively changed according to a state of said mobile station.

32.   The cell search method for a mobile station in a mobile communication system according to Claim 29, characterized in that a value of said weighting is adaptively changed according to the state of said mobile station.

33.   The cell search method for a mobile station in a mobile communication system according to Claim 30, characterized in that a value of said forgetting factor is adaptively

changed according to the state of said mobile station.

34. The cell search method for a mobile station in a mobile communication system according to Claim 31, characterized in that the state of said mobile station is either a state immediately after power-on or a standby state or a communicating state.

35. The cell search method for a mobile station in a mobile communication system according to Claim 31, characterized in that the state of said mobile station is set according to a movement speed of said mobile station in advance.

36. The cell search method for a mobile station in a mobile communication system according to Claim 32, characterized in that the state of said mobile station is either a state immediately after power-on or a standby state or a communicating state.

37. The cell search method for a mobile station in a mobile communication system according to Claim 32, characterized in that the state of said mobile station is set according to a movement speed of said mobile station in advance.

38. The cell search method for a mobile station in a mobile communication system according to Claim 33, characterized in that the state of said mobile station is either a state

immediately after power-on or a standby state or a communicating state.

39. The cell search method for a mobile station in a mobile communication system according to Claim 33, characterized in that the state of said mobile station is set according to a movement speed of said mobile station in advance.

40. A cell search method for a mobile station in a mobile communication system, the method being characterized by comprising a first step of despreading a received signal using a common spreading code common to all slots and detecting slot boundaries on the basis of a first average correlation coefficient, a second step of despreading the signal on the basis of said slot boundaries detected at the first step, using different individual spreading codes for said respective slots, and detecting frame boundaries and a scramble code group on the basis of a second average correlation coefficient, and a third step of descrambling a common pilot signal on the basis of said frame boundaries and scramble code group detected at the second step, and detecting a scramble code on the basis of a third average correlation coefficient, and wherein after said first, second, and third steps have been repeated, a scramble code is detected using a plurality of said third average correlation coefficients with which said frame boundaries and scramble code group detected at said second step are

equal.

41. The cell search method for a mobile station in a mobile
communication system according to Claim 40, characterized
5   in that said third step comprises calculating a seventh
average correlation coefficient by averaging, within a
predetermined averaging section, a plurality of said third
average correlation coefficients with which said frame
boundaries and scramble code group detected at said second
10 step are equal, and detecting said scramble codes using
the seventh average correlation coefficient.

42. The cell search method for a mobile station in a mobile
communication system according to Claim 41, characterized
15 in that a plurality of said third average correlation
values are weighted.

43. The cell search method for a mobile station in a mobile
communication system according to Claim 41, characterized
20 in that if said frame boundaries and scramble code groups
detected at said second step are respectively equal, a
value can be added which is obtained by multiplying an
eighth average correlation coefficient obtained by
averaging a plurality of said third average correlation
25 coefficients within a predetermined averaging section, by
a forgetting factor, and if said frame boundaries and
scramble code groups detected at said second step are

respectively different, a result of the addition of said third average correlation coefficients is defined as said seventh average correlation coefficient.

5   44.   The cell search method for a mobile station in a mobile communication system according to Claim 41, characterized in that said predetermined averaging section is adaptively changed according to a state of said mobile station.

10   45.   The cell search method for a mobile station in a mobile communication system according to Claim 42, characterized in that a value of said weighting is adaptively changed according to the state of said mobile station.

15   46.   The cell search method for a mobile station in a mobile communication system according to Claim 43, characterized in that a value of said forgetting factor is adaptively changed according to the state of said mobile station.

20   47.   The cell search method for a mobile station in a mobile communication system according to Claim 44, characterized in that the state of said mobile station is either a state immediately after power-on or a standby state or a communicating state.

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48.   The cell search method for a mobile station in a mobile communication system according to Claim 44, characterized

in that the state of said mobile station is set according
to a movement speed of said mobile station in advance.

49. The cell search method for a mobile station in a mobile
communication system according to Claim 45, characterized
in that the state of said mobile station is either a state
immediately after power-on or a standby state or a
communicating state.

50. The cell search method for a mobile station in a mobile
communication system according to Claim 45, characterized
in that the state of said mobile station is set according
to a movement speed of said mobile station in advance.

51. The cell search method for a mobile station in a mobile
communication system according to Claim 46, characterized
in that the state of said mobile station is either a state
immediately after power-on or a standby state or a
communicating state.

52. The cell search method for a mobile station in a mobile
communication system according to Claim 46, characterized
in that the state of said mobile station is set according
to a movement speed of said mobile station in advance.

53. A cell search apparatus for a mobile station in a
mobile communication system, the apparatus being

characterized by comprising a first detector for despreading a received signal using a common spreading code common to all slots and detecting slot boundaries on the basis of a first average correlation coefficient, a second
5 detector for despreading the signal on the basis of said slot boundaries detected at the first detector, using different individual spreading codes for said respective slots, and detecting frame boundaries and a scramble code group on the basis of a second average correlation
10 coefficient, and a third detector for descrambling a common pilot signal on the basis of said frame boundaries and scramble code group detected by the second detector, and detecting a scramble code on the basis of a third average correlation coefficient, and wherein said first detector
15 comprises means for storing a plurality of said first average correlation value obtained during a plurality of searches, second, and means for detecting slot boundaries using a plurality of said first average correlation coefficients.
20
54. The cell search apparatus for a mobile station in a mobile communication system according to Claim 53, characterized in that said second detector detects frame boundaries and a scramble code group using a plurality of
25 said second average correlation coefficients with which said slot boundaries detected by said first detector are equal.

55.   The cell search apparatus for a mobile station in a
mobile communication system according to Claim 53,
characterized in that said third detector detects a
5   scramble code using a plurality of said third average
correlation coefficients with which said frame boundaries
and scramble code group detected by said second detector
are equal.

10   56.   The cell search apparatus for a mobile station in a
mobile communication system according to Claim 53,
characterized in that said first detector comprises means
for calculating a fourth average correlation coefficient
by averaging a plurality of said first average correlation
15   coefficients within a predetermined averaging section, and
means for detecting said slot boundaries using a timing
with which the fourth average correlation coefficient is
largest.

20   57.   The cell search apparatus for a mobile station in a
mobile communication system according to Claim 54,
characterized in that said third detector detects a
scramble code using a plurality of said third average
correlation coefficients with which said frame boundaries
25   and scramble code group detected by said second detector
are equal.

58. The cell search apparatus for a mobile station in a
mobile communication system according to Claim 54,
characterized in that said first detector comprises means
for calculating a fourth average correlation coefficient
5   by averaging a plurality of said first average correlation
coefficients within a predetermined averaging section, and
means for detecting said slot boundaries using a timing
with which the fourth average correlation coefficient is
largest.

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59. The cell search apparatus for a mobile station in a
mobile communication system according to Claim 54,
characterized in that said second detector comprises means
for calculating a fifth average correlation coefficient
15   by averaging, within a predetermined averaging section,
a plurality of said second average correlation
coefficients with which said slot boundaries detected by
said first detector are equal, and means for detecting said
frame boundaries and scramble code group using a timing
20   with which the fifth average correlation coefficient is
largest.

60. The cell search apparatus for a mobile station in a
mobile communication system according to Claim 55,
25   characterized in that said first detector comprises means
for calculating a fourth average correlation coefficient
by averaging a plurality of said first average correlation

coefficients within a predetermined averaging section, and means for detecting said slot boundaries using a timing with which the fourth average correlation coefficient is largest.

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61. The cell search apparatus for a mobile station in a mobile communication system according to Claim 55, characterized in that said third detector comprises means for calculating a seventh average correlation coefficient

10 by averaging, within a predetermined averaging section, a plurality of said third average correlation coefficients with which said frame boundaries and scramble code group detected by said second detector are equal, and means for detecting said scramble codes using the seventh average

15 correlation coefficient.

62. The cell search apparatus for a mobile station in a mobile communication system according to Claim 57, characterized in that said first detector comprises means

20 for calculating a fourth average correlation coefficient by averaging a plurality of said first average correlation coefficients within a predetermined averaging section, and means for detecting said slot boundaries using a timing with which the fourth average correlation coefficient is

25 largest.

63. The cell search apparatus for a mobile station in a

mobile communication system according to Claim 57,
characterized in that said second detector comprises means
for calculating a fifth average correlation coefficient
by averaging, within a predetermined averaging section,
5 a plurality of said second average correlation
coefficients with which said slot boundaries detected by
said first detector are equal, and means for detecting said
frame boundaries and scramble code group using a timing
with which the fifth average correlation coefficient is
10 largest.

64. The cell search apparatus for a mobile station in a
mobile communication system according to Claim 57,
characterized in that said third detector comprises means
15 for calculating a seventh average correlation coefficient
by averaging, within a predetermined averaging section,
a plurality of said third average correlation coefficients
with which said frame boundaries and scramble code group
detected by said second detector are equal, and means for
20 detecting said scramble codes using the seventh average
correlation coefficient.

65. The cell search apparatus for a mobile station in a
mobile communication system according to Claim 56,
25 characterized in that a plurality of said first average
correlation values are weighted.

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66. The cell search apparatus for a mobile station in a mobile communication system according to Claim 56, characterized in that said fourth average correlation value is calculated by adding a value obtained by multiplying a plurality of said first average correlation values by a forgetting factor.

67. The cell search apparatus for a mobile station in a mobile communication system according to Claim 56, characterized in that said predetermined averaging section is adaptively changed according to a state of said mobile station.

68. The cell search apparatus for a mobile station in a mobile communication system according to Claim 65, characterized in that a value of said weighting is adaptively changed according to the state of said mobile station.

69. The cell search apparatus for a mobile station in a mobile communication system according to Claim 66, characterized in that a value of said forgetting factor is adaptively changed according to the state of said mobile station.

70. The cell search apparatus for a mobile station in a mobile communication system according to Claim 67,

characterized in that the state of said mobile station is either a state immediately after power-on or a standby state or a communicating state.

5   71. The cell search apparatus for a mobile station in a mobile communication system according to Claim 67, characterized in that the state of said mobile station is set according to a movement speed of said mobile station in advance.

10

72. The cell search apparatus for a mobile station in a mobile communication system according to Claim 68, characterized in that the state of said mobile station is either a state immediately after power-on or a standby

15 state or a communicating state.

73. The cell search apparatus for a mobile station in a mobile communication system according to Claim 68, characterized in that the state of said mobile station is

20 set according to a movement speed of said mobile station in advance.

74. The cell search apparatus for a mobile station in a mobile communication system according to Claim 69,

25 characterized in that the state of said mobile station is either a state immediately after power-on or a standby state or a communicating state.

75. The cell search apparatus for a mobile station in a mobile communication system according to Claim 69, characterized in that the state of said mobile station is set according to a movement speed of said mobile station in advance.

76. A cell search apparatus for a mobile station in a mobile communication system, the apparatus being characterized by comprising a first detector for despreading a received signal using a common spreading code common to all slots and detecting slot boundaries on the basis of a first average correlation coefficient, a second detector for despreading the signal on the basis of said slot boundaries detected by the first detector, using different individual spreading codes for said respective slots, and detecting frame boundaries and a scramble code group on the basis of a second average correlation coefficient, and a third detector for descrambling a common pilot signal on the basis of said frame boundaries and scramble code group detected by the second detector, and detecting a scramble code on the basis of a third average correlation coefficient, and wherein said second detector comprises means for storing a plurality of said second average correlation values with which said slot boundaries detected by said first detector are equal, and means for detecting frame boundaries and

a scramble code group using a plurality of said second
average correlation coefficients.

77. The cell search apparatus for a mobile station in a
mobile communication system according to Claim 76,
characterized in that said third detector comprises
detecting a scramble code using a plurality of said third
average correlation coefficients with which said frame
boundaries and scramble code group detected by said second
detector are equal.

78. The cell search apparatus for a mobile station in a
mobile communication system according to Claim 76,
characterized in that said second detector comprises means
for calculating a fifth average correlation coefficient
by averaging, within a predetermined averaging section,
a plurality of said second average correlation
coefficients with which said slot boundaries detected by
said first detector are equal, and means for detecting said
frame boundaries and scramble code group using a timing
with which the fifth average correlation coefficient is
largest.

79. The cell search apparatus for a mobile station in a
mobile communication system according to Claim 77,
characterized in that said second detector comprises means
for calculating a fifth average correlation coefficient

by averaging, within a predetermined averaging section, a plurality of said second average correlation coefficients with which said slot boundaries detected by said first detector are equal, and means for detecting said

5   frame boundaries and scramble code group using a timing with which the fifth average correlation coefficient is largest.

80.   The cell search apparatus for a mobile station in a

10   mobile communication system according to Claim 77, characterized in that said third detector comprises means for calculating a seventh average correlation coefficient by averaging, within a predetermined averaging section, a plurality of said third average correlation coefficients

15   with which said frame boundaries and scramble code group detected by said second detector are equal, and means for detecting said scramble codes using the seventh average correlation coefficient.

20   81.   The cell search apparatus for a mobile station in a mobile communication system according to Claim 78, characterized in that a plurality of said second average correlation values are weighted.

25   82.   The cell search apparatus for a mobile station in a mobile communication system according to Claim 78, characterized in that if said slot boundaries detected by

said first detector are equal, a value is added which is obtained by multiplying a sixth average correlation coefficient obtained by averaging a plurality of said second average correlation coefficients within a

5   predetermined averaging section, by a forgetting factor, and if said slot boundaries detected by said first detector are different, a result of the addition of said second average correlation coefficients is defined as said fifth average correlation coefficient.

10

83.   The cell search apparatus for a mobile station in a mobile communication system according to Claim 78, characterized in that said predetermined averaging section is adaptively changed according to a state of said mobile

15   station.

84.   The cell search apparatus for a mobile station in a mobile communication system according to Claim 81, characterized in that a value of said weighting is

20   adaptively changed according to the state of said mobile station.

85.   The cell search apparatus for a mobile station in a mobile communication system according to Claim 82,

25   characterized in that a value of said forgetting factor is adaptively changed according to the state of said mobile station.

86. The cell search apparatus for a mobile station in a mobile communication system according to Claim 83, characterized in that the state of said mobile station is
5 either a state immediately after power-on or a standby state or a communicating state.

87. The cell search apparatus for a mobile station in a mobile communication system according to Claim 83,
10 characterized in that the state of said mobile station is set according to a movement speed of said mobile station in advance.

88. The cell search apparatus for a mobile station in a
15 mobile communication system according to Claim 84, characterized in that the state of said mobile station is either a state immediately after power-on or a standby state or a communicating state.

20 89. The cell search apparatus for a mobile station in a mobile communication system according to Claim 84, characterized in that the state of said mobile station is set according to a movement speed of said mobile station in advance.

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90. The cell search apparatus for a mobile station in a mobile communication system according to Claim 85,

characterized in that the state of said mobile station is either a state immediately after power-on or a standby state or a communicating state.

5   91. The cell search apparatus for a mobile station in a mobile communication system according to Claim 85, characterized in that the state of said mobile station is set according to a movement speed of said mobile station in advance.

10

92. A cell search apparatus for a mobile station in a mobile communication system, the apparatus being characterized by comprising a first detector for despreading a received signal using a common spreading code

15   common to all slots and detecting slot boundaries on the basis of a first average correlation coefficient, a second detector for despreading the signal on the basis of said slot boundaries detected by the first detector, using different individual spreading codes for said respective

20   slots, and detecting frame boundaries and a scramble code group on the basis of a second average correlation coefficient, and a third detector for descrambling a common pilot signal on the basis of said frame boundaries and scramble code group detected by the second detector, and

25   detecting a scramble code on the basis of a third average correlation coefficient, and
wherein said third detector comprises means for storing

a plurality of said third average correlation coefficients
with which said frame boundaries and scramble code group
detected by said second detector are equal, and means for
detecting a scramble code is detected using a plurality

5   of said third average correlation coefficients.

93.   The cell search apparatus for a mobile station in a
mobile communication system according to Claim 92,
characterized in that said third detector comprises means

10   for calculating a seventh average correlation coefficient
by averaging, within a predetermined averaging section,
a plurality of said third average correlation coefficients
with which said frame boundaries and scramble code group
detected by said second detector are equal, and means for

15   detecting said scramble codes using the seventh average
correlation coefficient.

94.   The cell search apparatus for a mobile station in a
mobile communication system according to Claim 93,

20   characterized in that a plurality of said third average
correlation values are weighted.

95.   The cell search apparatus for a mobile station in a
mobile communication system according to Claim 93,

25   characterized in that if said frame boundaries and scramble
code groups detected by said second detector are
respectively equal, a value can be added which is obtained

by multiplying an eighth average correlation coefficient obtained by averaging a plurality of said third average correlation coefficients within a predetermined averaging section, by a forgetting factor, and if said frame

5 boundaries and scramble code groups detected by said second detector are respectively different, a result of the addition of said third average correlation coefficients is defined as said seventh average correlation coefficient.

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96. The cell search apparatus for a mobile station in a mobile communication system according to Claim 93, characterized in that said predetermined averaging section is adaptively changed according to a state of said mobile

15 station.

97. The cell search apparatus for a mobile station in a mobile communication system according to Claim 94, characterized in that a value of said weighting is

20 adaptively changed according to the state of said mobile station.

98. The cell search apparatus for a mobile station in a mobile communication system according to Claim 95,

25 characterized in that a value of said forgetting factor is adaptively changed according to the state of said mobile station.

99. The cell search apparatus for a mobile station in a mobile communication system according to Claim 96, characterized in that the state of said mobile station is either a state immediately after power-on or a standby state or a communicating state.

100. The cell search apparatus for a mobile station in a mobile communication system according to Claim 96, characterized in that the state of said mobile station is set according to a movement speed of said mobile station in advance.

101. The cell search apparatus for a mobile station in a mobile communication system according to Claim 97, characterized in that the state of said mobile station is either a state immediately after power-on or a standby state or a communicating state.

102. The cell search apparatus for a mobile station in a mobile communication system according to Claim 97, characterized in that the state of said mobile station is set according to a movement speed of said mobile station in advance.

103. The cell search apparatus for a mobile station in a mobile communication system according to Claim 98,

characterized in that the state of said mobile station is either a state immediately after power-on or a standby state or a communicating state.

5   104.   The cell search apparatus for a mobile station in a mobile communication system according to Claim 98, characterized in that the state of said mobile station is set according to a movement speed of said mobile station in advance.